Interaction of light, water, and nutrients availability effects leaf size in *Arabidopsis thaliana*

Jesica Fernandez and Bayan Hourani
Introductory Ecology, Bio 223
University of Bridgeport

Hypothesis

A decrease in water levels will inhibit nutrient absorption rate, a decrease in plant growth, and an increase progression of senescence and mortality in the *Arabidopsis thaliana* species. An increase in water levels and nutrient levels will aid in plant growth and decrease the progression of senescence and mortality.

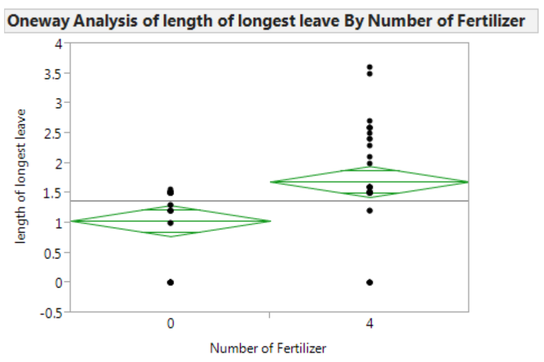
Introduction

Arabidopsis thaliana (Col-0*)* was exposed to two different amounts of fertilizer and different water levels. While growing some plants were given 4 fertilizer pellets while the others were not. Additionally, some plants' soil was kept moist through out the six weeks while the other set of plants had a chance to dry in between watering. Leaf number and length of largest leaf were measure at the end of the six week period of this experiment.

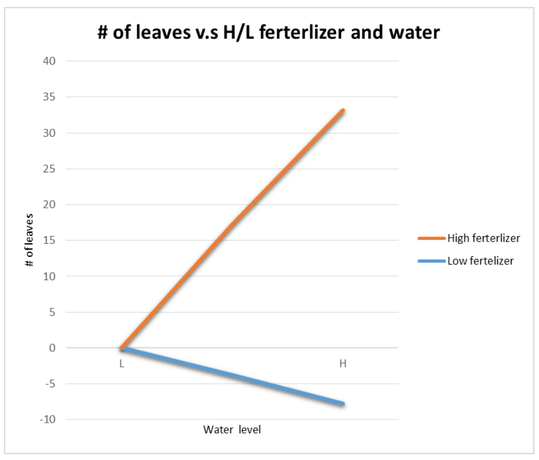
Methods and Materials

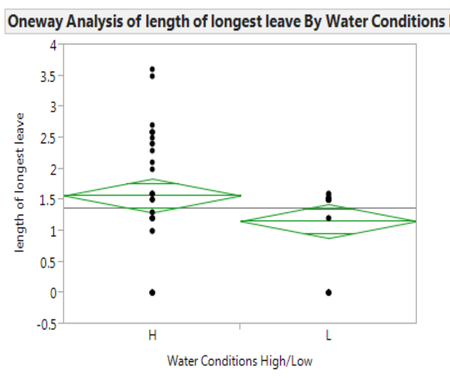
Soil: 4:1 Promix BX/Pearlite **Light**: 16 hours of light, 8 hours of dark
Temperature: 20 C during day, 18 C during night
Water:
High: *ad libitum* (1-3 inches of water at all times), allow the soil to stay moist
Low: enough water to moisten the soil, allow the soil to dry before each watering
Fertilizer:
High: 4 pellets of Osmocote fertilizer per pot prior to planting.
Low: None.

Results



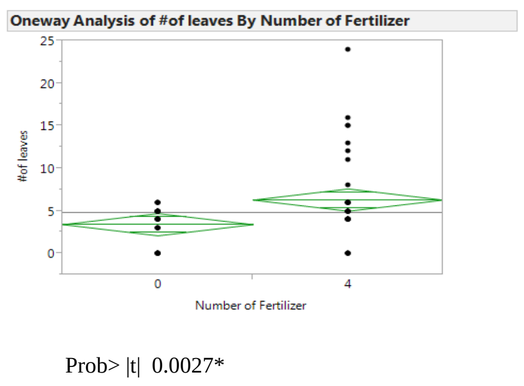
Prob> |t| 0.0007*



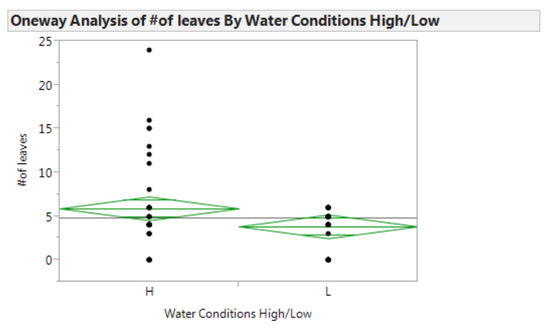


Prob> |t| 0.0365*

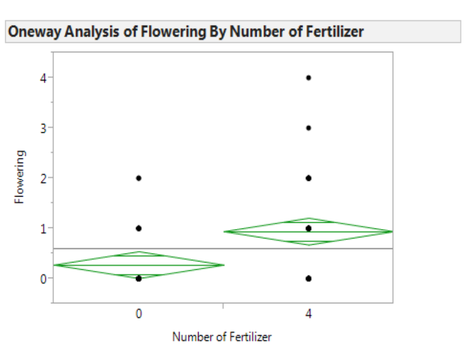
	P-values		
Variable	Water	Fertilizer	Water by Fertilizer
Longest Leaf	0.1259	0.4584	0.5247
Number of Leaves	0.3567	0.2156	0.4563
Flowers	**0.0158**	**0.0001**	**0.0015**



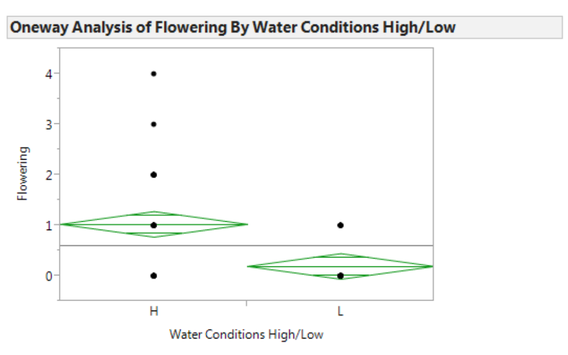
Prob> |t| 0.0027*



Prob> |t| 0.0354*



Prob> |t| 0.0008*



Prob> |t| <0.0001*

Discussion

1.Fertilizer treatments grew best with high water.

2.High water was only valuable for plants that were also receiving fertilizer.

3.High water inhibited plant growth for those plants that had low fertilizer.

4.The fertilizer had no influence in low water treatment.

Acknowledgements

University of Bridgeport, Dr. Engelmann